What is claimed is:

1. An apparatus for detecting occurrence of knocking of an engine from a signal sensed by a knocking sensor attached to the engine, comprising:

a plurality of filters extracting, from the signal sensed by the knocking sensor, a plurality of signal components whose frequency bands differ from each other; and

a knocking determination unit determining whether or not there is the occurrence of knocking on a basis of results outputted from the plurality of filters,

wherein the plurality of filters include a first type of filter of which pass band is set to a first specific frequency band including a first specific frequency of the signal from knocking sensor, the first specific frequency indicating the occurrence of knocking, and a second type of filter of which pass band is set to a second specific frequency band other than the first specific frequency band,

wherein both of the first and second types of filters have filtering characteristics, an inclination of the filtering characteristic of the second type of filter at a cut-off frequency thereof being steeper than an inclination of the filtering characteristic of the first type of filter at a cut-off frequency thereof.

2. The apparatus according to claim 1, wherein the first and second types of filters are composed of digital filters performing digital filtering on data obtained by applying an A/D conversion to the signal sensed by the knocking sensor at predetermined sampling intervals.

3. The apparatus according to claim 2, wherein the second type of filter is higher in a filter order than the first type of filter.

4. The apparatus according to claim 2, wherein the second type of filter is higher in a Q value than the first type of filter.

5. The apparatus according to claim 2, wherein both of the first and second types of filters are formed as IIR filters, the second type of

filter having a filtering characteristic set to be any of a Chebyshev characteristic, an inverse Chebyshev characteristic, and a simultaneous Chebyshev characteristic and the first type of filter having a filtering characteristic set to be a Butterworth characteristic.

6. The apparatus according to claim 2, wherein both of the first and second types of filters are formed as IIR filters, the second type of filter having a filtering characteristic set to be a simultaneous Chebyshev characteristic and the first type of filter having a filtering characteristic set to be any of an inverse Chebyshev characteristic and a Butterworth characteristic.

7. The apparatus according to claim 2, wherein the second type of filter is formed as an IIR filter and the first type of filter is formed as an FIR filter.

8. The apparatus according to claim 2, wherein each of the first type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the first specific frequency band and each of the second type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the second specific frequency band

wherein the mutually-different specific frequency bands each serving as the first specific frequency band have central frequencies set to a plurality of frequencies each serving as the first specific frequency.

9. The apparatus according to claim 8, wherein at least one of the plurality of filters belonging to the first type of filter has the pass band ranging at least two specific frequency bands belong to the first specific frequency band.

10. The apparatus according to claim 2, wherein each of the first type of filter includes a filter of which pass band is set a frequency band including a plurality of frequencies each indicating the occurrence of knocking.

11. The apparatus according to claim 1, wherein the second type of filter is higher in a filter order than the first type of filter.

12. The apparatus according to claim 11, wherein each of the first type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the first specific frequency band and each of the second type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the second specific frequency band

wherein the mutually-different specific frequency bands each serving as the first specific frequency band have central frequencies set to a plurality of frequencies each serving as the first specific frequency.

13. The apparatus according to claim 12, wherein at least one of the plurality of filters belonging to the first type of filter has the pass band ranging at least two specific frequency bands belong to the first specific frequency band.

14. The apparatus according to claim 1, wherein the second type of filter is higher in a Q value than the first type of filter.

15. The apparatus according to claim 14, wherein each of the first type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the first specific frequency band and each of the second type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the second specific frequency band

wherein the mutually-different specific frequency bands each serving as the first specific frequency band have central frequencies set to a plurality of frequencies each serving as the first specific frequency.

16. The apparatus according to claim 15, wherein at least one of the plurality of filters belonging to the first type of filter has the pass band

ranging at least two specific frequency bands belong to the first specific frequency band.

17. The apparatus according to claim 1, wherein each of the first type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the first specific frequency band and each of the second type of filter is composed of a plurality of filters of which pass bands are set to mutually-different specific frequency bands each serving as the second specific frequency band

wherein the mutually-different specific frequency bands each serving as the first specific frequency band have central frequencies set to a plurality of frequencies each serving as the first specific frequency.

18. The apparatus according to claim 17, wherein at least one of the plurality of filters belonging to the first type of filter has the pass band ranging at least two specific frequency bands belong to the first specific frequency band.

19. The apparatus according to claim 1, wherein each of the first type of filter includes a filter of which pass band is set a frequency band including a plurality of frequencies each indicating the occurrence of knocking.